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February 23, 2007

Re: 7373-111789

To Whom It May Concern:

This is to certify that a professional translator on our staff who is skilled in the Japanese language translated the enclosed JP04249767A from Japanese into English.

We certify that the attached English translation conforms essentially to the original Japanese language.

Kim Vitray
Operations Manager

Subscribed and sworn to before me this 23rd day of February, 2007.

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My Commission Expires
December 8, 2007

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JAPANESE PATENT OFFICE
PATENT JOURNAL (A)
KOKAI PATENT APPLICATION NO. HEI 4[1992]-249767

Int. Cl.[5]:	G 01 N 33/48 33/86 //C 12 Q 1/56
Sequence Nos. for Office Use:	7055-2J 6807-4B
Filing No.:	Hei 3[1991]-187
Filing Date:	January 7, 1991
Publication Date:	September 4, 1992
No. of Claims:	1 (Total of 4 pages)
Examination Request:	Not filed

BLOOD SAMPLING CONTAINERS

Applicant:	000002174 Sekisui Chemical Co., Ltd. 2-4-4 Nishitenman, Kita-ku, Osaka-shi, Osaka-fu
Inventor:	Yasuo Ono 1-25-1 Himurodai, Hirakata-shi, Osaka-fu

[There are no amendments to this patent.]

Abstract

Constitution

Blood sampling containers containing anticoagulants such as sodium citrate, etc., and antifibrinolytics such as t-PA inhibitors, etc.

Effect

Even when the blood plasma of a patient to whom tissue-type plasminogen activator (t-PA) has been administered is stored, the action of t-PA can be obstructed by antifibrinolytics so that the fluctuation of the coagulation-fibrinogenolysis component contents in the blood plasma such as fibrinogen, etc., can be prevented.

Claim

Blood sampling containers, characterized in that anticoagulants and antifibrinolytics are kept in the containers.

Detailed explanation of the invention

[0001]

Industrial application field

The present invention relates to blood sampling containers, more specifically to blood sampling containers suitable for a type of examination.

[0002]

Prior art

Among the blood tests, the blood coagulation test is an important clinical test method for isolating diseases such as hemorrhagic diseases, thrombosis, etc. In the coagulation-fibrinogenolysis blood test, first a sample of the patient's whole blood is collected in a blood sampling container. As the blood sampling containers, containers made of glass or plastics containing a suitable amount of anticoagulants have been used. As the anticoagulants, sodium citrate, heparin, etc., are used, but in a coagulation test, a sodium citrate solution with a concentration of 3.1-3.8% has been put into the containers.

[0003]

Problem to be solved by the invention

According to the patient, sometimes fibrinogenolysis activators such as tissue-type plasminogen activators (hereinafter abbreviated as t-PA) have been administered. In blood plasma samples from such patients to which sodium citrate had been added, the blood plasma components such as fibrinogen, plasminogen, etc., were consumed and degraded during storage by the action of t-PA, and in some cases it notably influenced the clinical tests, especially coagulation-fibrinogenolysis tests.

[0004]

Thus, the purpose of the present invention is to solve the problem of the aforementioned conventional blood sampling containers and to provide blood sampling containers with which coagulation-fibrinogenolysis tests can be accurately performed even when blood samples from patients administered fibrinogenolysis activators are stored for a certain time.

[0005]

Means to solve the problem

The present inventor assiduously conducted a study of the problem of the aforementioned conventional blood sampling containers and as a result it was thought that if a t-PA inhibitor was added beforehand to the blood sampling tubes in order to inhibit the action of the administered t-PA, the consumption and degradation of fibrinogen and plasminogen due to the action of t-PA could be inhibited, thereby the present invention was attained. Namely, the purpose of the present invention is blood sampling containers characterized by containing anticoagulants and antifibrinolytics.

[0006]

In the present invention, the blood sampling containers may be formed from polymers such as thermoplastic resins, thermosetting resins, modified natural resins, or glass. As thermoplastic resins, for example, polyethylene, polypropylene, poly(4-methyl-1-pentene), polystyrene, polymethyl methacrylate, polyvinyl chloride, polyethylene terephthalate, polybutylene terephthalate, styrene-acrylonitrile copolymers, styrene-butadiene copolymers, styrene-isoprene copolymers, styrene-maleic anhydride copolymers, styrene-acrylic acid copolymers, styrene-methyl methacrylate copolymers, ethylene-propylene copolymers, ethylene-acrylic acid copolymers, ethylene-acrylic ester copolymers, acetalized polyvinyl alcohol, butyralized polyvinyl alcohol, etc., are used. As thermosetting resins, for example, unsaturated polyester resins, epoxy resins, epoxy-acrylate resins, etc., are used. Further, as modified natural resins acetic acid cellulose, propionic acid cellulose, acetic acid-butyric acid cellulose, ethyl cellulose, ethyl chitin, etc., are used.

[0007]

As glass, for example, silicate glasses such as soda-lime glass, phosphosilicate glass, borosilicate glass, etc., and quartz glass are preferably used. The blood sampling containers of the present invention are made of the aforementioned materials and contain anticoagulants and antifibrinolytics. As the anticoagulants, sodium citrate and heparin, which have been used in the past, are used. In the case of, for example, sodium citrate, aqueous solutions of 3.1-3.8 wt%

sodium citrate are generally used. When it is used for blood sampling containers, the sodium citrate is kept in the blood sampling containers so as to make the concentration of sodium citrate in the blood 0.2-0.5 wt% and preferably 0.3-0.4 wt%. In the case of heparin, for example, heparin is dissolved in physiological saline at a concentration of 500-1,000 IU/mL and used. When it is used for blood sampling containers, the heparin is kept in the blood sampling containers so as to make the concentration of heparin in the blood 5-100 IU/mL.

[0008]

Further, as antifibrinolytics, t-Pa inhibitors or low-molecular-weight serine protease inhibitors are used. As the t-Pa inhibitors, prolyl-phenylalanyl-chloromethylketone (PPACK [D-phenylalanyl-L-prolyl-L-arginine chloromethylketone]) or plasminogen activator inhibitor (PAI) is used. As the low-molecular-weight serine protease inhibitors, ε-aminocaproic acid (EACA), gabexate mesilate (FOY), phenylmethanesulfonyl fluoride (PMSF), (2R, 4R)-4-methyl-1-(N^2-(3-methyl-1,2,3,4-tetrahydro-8-quinolinesulfonyl)-L-arginyl)-2-piperidine carboxylic acid monohydrate (MD805), etc., are used.

[0009]

When the aforementioned antifibrinolytics are used for blood sampling containers, the agents are kept in the blood sampling containers so as to make their concentration in blood 0.01-0.5 mM for PPACK, 0.01-0.5 mM for PAI, 0.01-0.5 mM for EACA, 0.1-500 μg/mL for FOY, 0.1-500 μg/mL for PMSF, and 0.1-500 μg/mL for MD805.

[0010]

Further, the aforementioned anticoagulants and antifibrinolytics are kept in blood sampling containers as a liquid, powder or lyophilizate. Further, the blood sampling containers of the present invention are capped with, for example, butyl rubber caps, and there may or may not be an internal vacuum.

[0011]

Effect

In medical treatment, t-PA naturally exists in the blood plasma of patients administered t-PA. Therefore in conventional blood sampling containers degradation of fibrinogen, degradation and consumption of plasminogen, or formation of α_2-PI (α_2 plasmin inhibitor)-plasmin complex occurred due the action of t-PA while the samples were allowed to stand. Therefore, accurate values in clinical coagulation-fibrinogenolysis tests such as measurement of fibrinogen content, could not be obtained.

[0012]

In contrast to this, in the present invention the antifibrinolytics obstruct the plasminogen activation action of t-PA since not only anticoagulants but also antifibrinolytics are kept in the blood sampling containers beforehand. Therefore, the fluctuation of the contents of components such as fibrinogen, plasminogen, etc., in the blood plasma can be prevented even when the blood plasma of patients administered t-PA is stored for a certain period.

[0013]

Application example

Hereinafter an unrestricted application examples of the present invention will be explained and the present invention will be elucidated by this.

Application Example 1

A blood sampling tube of the present invention was prepared by putting 0.5 mL of a solution containing 3.8% sodium citrate and 1 mM PPACK (Karpio Co.) into a 7 mL blood sampling tube made of polyethylene terephthalate. Then, a 4.5 mL blood sample from a healthy person was put into the blood sampling tube and 5 μg t-PA (Technoclone Co.) were added. It was well mixed by inversion and centrifuged at 3000 rpm for 10 min. After centrifugation, the supernatant blood plasma was sampled, and the fibrinogen content and the α_2-PI-plasmin complex content were immediately measured at fixed time intervals.

[0014]

Furthermore, the fibrinogen content was measured by a fibrinometer (BBL Co.) using a fibrinogen measurement reagent (Kokusai Reagent Co.). The α_2-PI-plasmin complex content was measured using the-PIC test EIA (Teijin Co.).

The results are shown in Tables 1 and 2 below.

Comparative Example 1

A blood sampling tube was prepared by pouring only 0.5 mL of a 3.8% sodium citrate solution (without PPACK) into a blood sampling tube. Blood plasma was sampled in the same manner as in Application Example 1 and the fibrinogen and α_2-PI-plasmin complex content were measured in the same way as in Application Example 1. The results are shown in Tables 1 and 2 below.

[0015]

As it is clear from Tables 1 and 2, the fibrinogen and α_2-PI-plasmin complex content were not changed in the blood sampling container of Application Example 1 up to 5 h after sampling. In the blood sampling container of Comparative Example 1 however, the fibrinogen content decreased greatly with elapsed time, moreover the α_2-PI-plasmin complex content increased to extremely high values with elapsed time.

[0016]

Table 1

Fibrinogen content (μg/dL)

Standing time	Application Example 1	Comparative Example 1
Immediately after plasma sampling	320	320
After 1 h	320	300
After 3 h	320	280
After 5 h	315	250

[0017]

Table 2

α_2-PI-plasmin complex content (μg/mL)

Standing time	Application example 1	Comparative example 1
Immediately after plasma sampling	0.8	0.8
After 1 h	0.8	0.8
After 2 h	0.8	0.9
After 3 h	0.8	1.2
After 5 h	0.8	1.5

[0018]

Application Example 2

A blood sampling tube of the present invention was prepared by putting 0.2 mL of a solution containing 3.13% sodium citrate and 1 mM PAI (American Diagnostica Co.) into a 5 mL glass blood sampling tube coated with silicone. Then 1.8 mL of blood sampled from healthy person was put into the blood sampling tube and 2 μg t-PA (Technoclone Co.) were added in the same manner as in the case of Application Example 1. It was well mixed by inversion and centrifuged at 3000 rpm for 10 min. After centrifugation, the supernatant plasma was sampled and the plasminogen activity in the blood plasma was measured immediately after sampling and

after 3 h. The plasminogen activity was measured using a Test team PLG (Daiichi Kagaku Yakuhin K.K.). The results immediately after sampling were 105%, and were 105% after 3 h, showing no change.

Comparative Example 2

A blood sampling tube was prepared by pouring 0.2 mL of a solution of only 3.13% sodium citrate into a blood sampling tube. The blood plasma was sampled in the same manner as in Application Example 2 except that the above blood sampling container was used. Then the plasminogen activity in the blood plasma was measured immediately after sampling and after 3 h in the same manner as in Application Example 2. As a result the plasminogen activity immediately after sampling was 105%, but the plasminogen activity after 3 h decreased to 95%.

[0019]

Effect of the invention

In the present invention, the action of t-PA in the blood plasma of patients is inhibited by the action of the antifibrinolytics since anticoagulants and antifibrinolytics are kept in the blood sampling containers beforehand so that the fluctuation of the fibrinogen and plasminogen concentrations due to the action of t-PA during storage can be prevented even when the blood plasmas of patients administered t-PA are stored. Thus the blood coagulation-fibrinogenolysis tests on the blood plasma of patients administered t-PA can be carried out precisely.

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[0016]

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Application Example 2

A blood sampling tube of the present invention was prepared by putting 0.2 mL of a solution containing 3.13% sodium citrate and 1 mM PAI (American Diagnostica Co.) into a 5 mL glass blood sampling tube coated with silicone. Then 1.8 mL of blood sampled from healthy person was put into the blood sampling tube and 2 μg t-PA (Technoclone Co.) were added in the same manner as in the case of Application Example 1. It was well mixed by inversion and centrifuged at 3000 rpm for 10 min. After centrifugation, the supernatant plasma was sampled and the plasminogen activity in the blood plasma was measured immediately after sampling and

after 3 h. The plasminogen activity was measured using a Test team PLG (Daiichi Kagaku Yakuhin K.K.). The results immediately after sampling were 105%, and were 105% after 3 h, showing no change.

Comparative Example 2

A blood sampling tube was prepared by pouring 0.2 mL of a solution of only 3.13% sodium citrate into a blood sampling tube. The blood plasma was sampled in the same manner as in Application Example 2 except that the above blood sampling container was used. Then the plasminogen activity in the blood plasma was measured immediately after sampling and after 3 h in the same manner as in Application Example 2. As a result the plasminogen activity immediately after sampling was 105%, but the plasminogen activity after 3 h decreased to 95%.

[0019]

Effect of the invention

In the present invention, the action of t-PA in the blood plasma of patients is inhibited by the action of the antifibrinolytics since anticoagulants and antifibrinolytics are kept in the blood sampling containers beforehand so that the fluctuation of the fibrinogen and plasminogen concentrations due to the action of t-PA during storage can be prevented even when the blood plasmas of patients administered t-PA are stored. Thus the blood coagulation-fibrinogenolysis tests on the blood plasma of patients administered t-PA can be carried out precisely.

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February 23, 2007

Re: 7373-111789

To Whom It May Concern:

This is to certify that a professional translator on our staff who is skilled in the Japanese language translated the enclosed JP04249767A from Japanese into English.

We certify that the attached English translation conforms essentially to the original Japanese language.

Kim Vitray
Operations Manager

Subscribed and sworn to before me this 23rd day of February, 2007.

TINA WUELFING
Notary Public
State of Texas
My Commission Expires
December 8, 2007

Tina Wuelfing
Notary Public

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	33/86		7055－２Ｊ		
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審査請求　未請求　請求項の数１（全　４　頁）

(21)出願番号　特願平3－187

(22)出願日　平成３年(1991)１月７日

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大阪府枚方市氷室台１丁目25番１号

(54)【発明の名称】　採血容器

(57)【要約】

【構成】　容器内に、クエン酸ナトリウム等の抗凝固薬剤及びｔ－ＰＡインヒビター等の抗線溶薬剤を存在させてなる採血容器。

【効果】　組織プラスミノーゲンアクチベーター（ｔ－ＰＡ）が投与された患者の血漿を保存した場合でも、抗線溶薬剤によりｔ－ＰＡの作用を阻害することができ、それによってフィブリノーゲン等の血漿中の凝固・線溶系成分の値の変動を防止することができる。

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【特許請求の範囲】

【請求項1】容器内に、抗凝固薬剤及び抗線溶薬剤を存在させたことを特徴とする、採血容器。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、採血容器に関し、特に、凝固・線溶系の検査に好適な採血容器に関する。

【0002】

【従来の技術】血液検査の中でも、血液凝固検査は、各種の出血性疾患や血栓症等の疾患の判定のための重要な臨床検査法である。このような血液の凝固系及び線溶系の検査に際しては、先ず、患者の全血を試料として採血容器内に採取する。採血容器としては、内部に抗凝固薬剤が適当量収められたガラスまたはプラスチックからなるものが用いられていた。抗凝固薬剤としては、クエン酸ナトリウムやヘパリン等が用いられているが、凝固系の検査では、通常、3．1～3．8％の濃度のクエン酸ナトリウム液が収納されていた。

【0003】

【発明が解決しようとする課題】患者によっては、線溶賦活剤として、例えば組織プラスミノーゲンアクチベータ（以下、t－PA）が投与されていることがある。このような場合、該患者から採取したクエン酸ナトリウム添加血漿では、保存中に血漿中の成分、例えばフィブリノーゲンやプラスミノーゲンがt－PAの作用により消費・分解され、保存後に実施される臨床検査、特に、凝固・線溶系検査に著しい影響を及ぼすことがあった。

【0004】よって、本発明は、上述した従来の採血容器における問題点を解消し、線溶賦活剤が投与された患者の血液試料をある程度の期間保存した場合であっても凝固・線溶系の検査を正確に行うことを可能とする採血容器を提供することを目的とする。

【0005】

【課題を解決するための手段】本願発明者らは、上記のような従来の採血容器における問題点につき鋭意検討した結果、投与されていたt－PAの作用を抑制するために、予め採血管内にt－PAのインヒビター等を加えておけば、t－PAの作用によるフィブリノーゲンやプラスミノーゲンの消費・分解を抑制し得るのではないかと考え、本発明をなすに至った。すなわち、本発明の要旨は、容器内に、抗凝固薬剤及び抗線溶薬剤を存在させたことを特徴とする採血容器である。

【0006】本発明において、採血容器は、熱可塑性樹脂、熱硬化性樹脂もしくは変性天然樹脂のような樹脂またはガラスの何れの材料から形成されていてもよい。熱可塑性樹脂としては、例えば、ポリエチレン、ポリプロピレン、ポリ－4－メチルペンテン－1、ポリスチレン、ポリメチルメタクリレート、ポリ塩化ビニル、ポリエチレンテレフタレート、ポリブチレンテレフタレート、スチレン－アクリロニトリル共重合体、スチレン－

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ブタジエン共重合体、スチレン－イソプレン共重合体、スチレン－無水マレイン酸共重合体、スチレン－アクリル酸共重合体、スチレン－メチルメタクリレート共重合体、エチレン－プロピレン共重合体、エチレン－アクリル酸共重合体、エチレン－アクリル酸エステル共重合体、ポリビニルアルコールアセタール化物、ポリビニルアルコールブチラール化物等が、熱硬化性樹脂としては、例えば、不飽和ポリエステル樹脂、エポキシ樹脂、エポキシ－アクリレート樹脂等が、変性天然樹脂としては、酢酸セルロース、プロピオン酸セルロース、酢酸酪酸セルロース、エチルセルロース、エチルキチン等が用いられる。

【0007】ガラスとしては、例えば、ソーダ石灰ガラス、リンケイ酸ガラス、ホウケイ酸ガラス等のケイ酸塩ガラスや石英ガラス等が好ましく用いられる。本発明の採血容器では、上記のような材料からなる容器内に、抗凝固薬剤及び抗線溶薬剤が存在する。抗凝固薬剤としては、従来より用いられているクエン酸ナトリウムやヘパリン等が用いられる。例えば、クエン酸ナトリウムの場合は、通常3．1～3．8重量％の水溶液が使用され、採血容器の使用時に、血液中のクエン酸ナトリウムの固形分濃度が0．2～0．5重量％、好ましくは、0．3～0．4重量％となるように、該容器内に存在させる。ヘパリンの場合は、例えば生理食塩水に、500～1000IU／mlの濃度に溶解されたものが使用され、採血容器の使用時に、血液中のヘパリン濃度が5～100IU／mlとなるように、該容器内に存在させる。

【0008】また、抗線溶薬剤としては、t－PAのインヒビターまたは低分子セリンプロテアーゼインヒビターが用いられる。t－PAのインヒビターとしては、プロリル－フェニルアラニル－クロロメチルケトン（PPACK）またはプラスミノーゲンアクチベーターインヒビター（PAI）が用いられ、低分子セリンプロテアーゼインヒビターとしては、ε－アミノカプロン酸（EACA）、メチル酸ガベキサート（FOY）、フェニルメタンスルホニルフルオリド（PMSF）または（2R，4R）－4－メチル－1－｛N²－（3－メチル－1，2，3，4－テトラヒドロ－8－キノリンスルフォニル）－L－アルギニル｝－2－ピペリジンカルボキシル酸モノハイドレイト（MD805）等が用いられる。

【0009】上記のような抗線溶薬剤が、採血容器の使用時に、血液中のそれぞれの濃度がPPACK0．01～0．5mM、PAI0．01～0．5mM、EACA0．01～0．5mM、FOY0．1～500μg／ml、PMSF0．1～500μg／ml、MD805については0．1～500μg／mlとなるように、該容器内に存在させる。

【0010】また、上記抗凝固薬剤及び線溶薬剤は、液状の状態で採血容器内に存在していてもよく、粉末状態あるいは凍結乾燥状態で存在していてもよい。また、本

発明の採血容器は、例えばブチルゴム製のキャップが施され、内部が真空にされた真空タイプのものでも、または、非真空タイプのものでもいずれでもよい。

【0011】

【作用】治療に際しｔ－ＰＡが投与された患者の血漿中には当然のことながら、該ｔ－ＰＡが存在する。従って、従来の採血容器では、ｔ－ＰＡの作用により、放置している間に、フィブリノーゲンの分解やプラスミノーゲンの分解・消費またはα_2 ＰＩ（α_2 プラスミンインヒビター）－プラスミン複合体が生成されてしまっていた。そのため、フィブリノーゲン値の測定等の凝固・線溶系の臨床検査に際し正確な値を得ることができなかった。

【0012】これに対して、本発明では、採血容器内に予め抗凝固薬剤だけでなく、上述した抗線溶薬剤が存在されているため、抗線溶薬剤がｔ－ＰＡのプラスミノーゲン活性化作用を阻害する。従って、ｔ－ＰＡを投与されていた患者の血漿をある程度の期間保存したとしても、該血漿中のフィブリノーゲンやプラスミノーゲン等の成分の値の変動を防止することができる。

【0013】

【実施例】以下、本発明の非限定的な実施例を説明することにより、本発明を明らかにする。

実施例１

７ｍｌのポリエチレンテレフタレートよりなる有底採血管に、予め、３．８％クエン酸ナトリウム及びＰＰＡＣＫ（カルビオ社製）１ｍＭを含有する液０．５ｍｌを入れ、本発明の採血容器を得た。この採血容器に、健常者より採血した血液４．５ｍｌを加え、次いでｔ－ＰＡ（テクノクローン社製）５μｇを加えた。よく転倒・混和し、しかる後３０００ｒｐｍの回転速度で１０分間遠心分離した。遠心分離後、上澄みの血漿を採取し、採取直後、並びに一定時間経過毎にフィブリノーゲン値及びα_2 ＰＩ－プラスミン複合体値を測定した。

【0014】なお、フィブリノーゲン値の測定は、フィブリノーゲン測定試薬（国際試薬社製）を用い、フィブィロメータ（ＢＢＬ社製）により行った。また、α_2 ＰＩ－プラスミン複合体の測定は、ＰＩＣテストＥＩＡ（帝人株式会社製）を用いて行った。結果を、下記の表１及び表２に示す。

比較例１

採血管内にＰＰＡＣＫを存在させずに、３．８％クエン酸ナトリウム液０．５ｍｌのみを入れ採血容器を得た。この容器を使用し、他は実施例１とまったく同様にして血漿を採取し、実施例１と同様に、採取直後及び一定時間経過毎にフィブリノーゲン値及びα_2 ＰＩ－プラスミン複合体値を測定した。結果を、表１及び表２に示す。

【0015】表１及び表２から明らかなように、実施例１の採血容器では、フィブリノーゲン値及びα_2 ＰＩ－プラスミン複合体値の何れもが採取直後から５時間後に至るまでほとんど変化していないのに対し、比較例１の採血容器では、フィブリノーゲン値が時間の経過と共に大きく低下し、かつα_2 ＰＩ－プラスミン複合体値が時間の経過と共に非常に高くなることがわかる。

【0016】

【表１】

フィブリノーゲン値（μｇ／ｄｌ）

放置時間	実施例１	比較例１
血漿採取直後	３２０	３２０
１時間後	３２０	３００
３時間後	３２０	２８０
５時間後	３１５	２５０

【0017】

【表２】

α_2 ＰＩ－プラスミン複合体値（μｇ／ｍｌ）

放置時間	実施例１	比較例１
血漿採取直後	０．８	０．８
１時間後	０．８	０．８
２時間後	０．８	０．９
３時間後	０．８	１．２
５時間後	０．８	１．５

【0018】実施例２

５ｍｌの大きさのシリコンコーティングされたガラス採血管に、３．１３％クエン酸ナトリウム及び１ｍＭのＰＡＩ（アメリカンダイアグノスティカ社製）を含む液０．２ｍｌを入れ、本発明の採血容器を得た。この採血容器に、実施例１の場合と同一の健常者より採血した血液１．８ｍｌを加え、次いでｔ－ＰＡ（テクノクローン社製）２μｇを加えた。よく転倒・混和し、３０００ｒｐｍ及び１０分間の条件で遠心分離した。しかる後、上澄みの血漿を採取し、採取直後及び３時間経過後に、血漿中のプラスミノーゲン活性を測定した。測定は、テストチームＰＬＧ（第一化学薬品社製）を用いて行った。その結果、採取直後のプラスミノーゲン活性が１０５％であり、３時間経過後においても１０５％と変化のないことが確かめられた。

比較例２

採血管内に３．１３％クエン酸ナトリウム液０．２ｍｌのみを入れ、採血容器を得た。この採血容器を使用したことを除いては、実施例２とまったく同様にして血漿を採取し、採取直後及び３時間経過後の血漿中のプラスミノーゲン活性を実施例２と同様にして測定した。その結果、採取直後のプラスミノーゲン活性が１０５％であったのに対し、３時間経過後にはプラスミノーゲン活性は９５％まで低下していた。

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【0019】

【発明の効果】本発明では、採血容器内に抗凝固薬剤及び抗線溶薬剤が予め入れられているため、該抗線溶薬剤の作用により患者血漿中に含まれているｔ－ＰＡの作用を抑制することができ、従ってｔ－ＰＡが投与されていた患者の血漿を保存したとしても、保存中のｔ－ＰＡの作用によるフィブリノーゲン値やプラスミノーゲン活性等の変動を防止することができる。従って、ｔ－ＰＡを投与された患者の血漿についての血液凝固・線溶系の検査を正確に行うことが可能となる。